

FORM PTO-1449  
U.S. Department of Commerce Patent and Trademark Office

NOV 04 2002

INFORMATION DISCLOSURE STATEMENT  
BY APPLICANT

Docket No.:  
INVIT1290-2

Applicants: Carrino et al.

Application No.:  
10/014,128

Filing Date:  
December 7, 2001

Group Art Unit:  
1645

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NOV 07 2002

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### U.S. PATENT DOCUMENTS

EXAM. INITIALS	DOCUMENT NUMBER	DATE	NAME	CLASS	SUB-CLASS	FILING DATE
<i>[Signature]</i>	US 6,277,632 B1	08/21/01	Harney			
<i>[Signature]</i>	US 6,340,595 B1	01/22/02	Vogels et al.			

### FOREIGN PATENT DOCUMENTS

EXAM. INITIALS	DOCUMENT NUMBER	DATE	COUNTRY	CLASS	SUB-CLASS	TRANSLATION (YES/NO)
	WO 97/48716	12/24/97	PCT			
	WO 98/56943	12/17/98	PCT			

### OTHER DOCUMENTS (Including Author, Title, Date, Pertinent Pages)

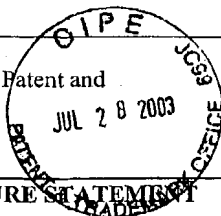
	NONE

EXAMINER <i>[Signature]</i>	DATE CONSIDERED <i>2/2/04</i>
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<b>FORM PTO-1449</b> U.S. Department of Commerce Patent and Trademark Office 1	<b>Docket No.:</b> INVIT1290-2	<b>Application No.:</b> 10/014,128
	<b>Applicants:</b> Carrino, et al.	
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**U.S. PATENT DOCUMENTS**

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EXAM. INITIALS	DOCUMENT NUMBER	DATE	NAME	CLASS	SUB- CLASS	FILING DATE
JS	US 6,013,440	01/11/00	Lipshutz, et. al.	—	—	
	6,140,086	10/31/00	Fox et al.	—	—	
	US 2001/0044137 A1	11/22/01	Heyman et al.	—	—	
	US 2002/0025561 A1	02/28/02	Hodgson	—	—	
	US 2002/0028444 A1	03/07/02	Harney et al.	—	—	
	US 2002/0068290	06/06/02	Yarovinsky	—	—	
	US 2002/0182731 A1	12/05/02	Ji et al.	—	—	
JS	US 6,537,776 B1	03/25/03	Short	—	—	
	US 6,548,277 B1	04/15/03	Shuman	—	—	

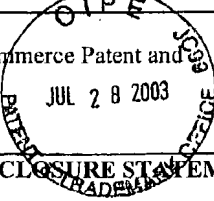
**FOREIGN PATENT DOCUMENTS**

EXAM. INITIALS	DOCUMENT NUMBER	DATE	COUNTRY	CLASS	SUB- CLASS	TRANSLATION (YES/NO)
JS	WO 00/12687	03/09/00	PCT	—	—	

<b>EXAMINER</b> Jeffrey Sun	<b>DATE CONSIDERED</b> 2/2/02
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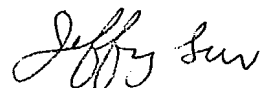
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**OTHER DOCUMENTS (Including Author, Title, Date, Pertinent Pages)**

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	Heyman et al., "Genome-Scale Cloning and Expression of Individual Open Reading Frames Using Topoisomerase I-Mediated Ligation," <i>Genome Research</i> , pp 383-392. (1999)

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### U.S. PATENT DOCUMENTS

EXAM. INITIALS		DOCUMENT NUMBER	DATE	NAME	CLASS	SUB-CLASS	FILING DATE
JS	AA	4,661,450	04/28/87	Kempe et al	—	—	
	AB	4,800,159	01/24/89	Mullis et al.	—	—	
	AC	5,624,826	04/29/97	Kato, et al.	—	—	
	AD	5,766,891	06/16/98	Shuman	—	—	
	AE	5,958,681	09/28/99	Wetmur et al.	—	—	
	AF	6,238,884 B1	05/29/01	Short and Frey	—	—	
	AG	6,280,977 B1	08/28/01	Liang and Felgner	—	—	
JS	AH	6,291,213 B1	09/18/01	Rothstein	—	—	

### FOREIGN PATENT DOCUMENTS

EXAM. INITIALS		DOCUMENT NUMBER	DATE	COUNTRY	CLASS	SUB-CLASS	TRANSLATION (YES/NO)
JS	AI	85/04898	11/07/85	PCT			
	AJ	0 373 914 A2	06/20/90	EP			
	AK	0 625 572 A1	11/23/94	EP			
	AL	WO 94/29443	12/22/94	PCT			
	AM	WO 96/19497	06/27/96	PCT			
	AN	WO 96/34981	11/07/96	PCT			
JS	AO	WO 97/24455	07/10/1997	PCT			

<b>EXAMINER</b> <i>Jeffrey S. Lee</i>	<b>DATE CONSIDERED</b> 2/2/04
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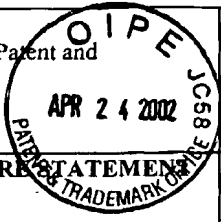
	AP	WO 98/20122	05/14/98	PCT			Yes (Abstract)
JS	AQ	WO 98/55502	12/10/98	PCT	—	—	
	AR	WO 98/56943	12/17/98	PCT	—	—	
JS	AS	WO 00/56878	09/28/00	PCT	—	—	

**OTHER DOCUMENTS (Including Author, Title, Date, Pertinent Pages)**


JS	AT	Carninci et al. "High-Efficiency Full-Length cDNA Cloning by Biotinylated CAP Trapper," <i>Genomics</i> , 37(3):327-36 (1996) Academic Press, Inc.
	AU	Carninci et al. "High Efficiency Selection of Full-Length cDNA by Improved Biotinylated Cap Trapper," <i>DNA Research</i> , 4:61-66 (1997). Universal Academy Press.
	AV	Cheng and Shuman, "DNA Strand Transfer Catalyzed by Vaccinia Topoisomerase: Ligation of DNAs Containing a 3' Mononucleotide Overhang," <i>Nucleic Acids Res.</i> , 28(9):1893-1898. (2000). Oxford University Press.
	AW	Cheng and Shuman, "Recombinogenic Flap Ligation Pathway for Intrinsic Repair of Topoisomerase IB-Induced Double-Strand Breaks," <i>Mol. Cell. Biol.</i> 20(21):8059-8068 (2000) American Society for Microbiology.
	AX	Cheng and Shuman, "Site-Specific DNA Transesterification by Vaccinia Topoisomerase: Role of Specific Phosphates and Nucleosides," <i>Biochemistry</i> 38(50):16599-16612 (1999) American Chemical Society.
	AY	Cheng and Shuman, "A Catalytic Domain of Eukaryotic DNA Topoisomerase I," <i>J. Biol. Chem.</i> 273(19):11589-11595 (1998) The American Society for Biochemistry and Molecular Biology, Inc.
JS	AZ	Cheng et al., "Conservation of Structure and Mechanism Between Eukaryotic Topoisomerase I and Site-Specific Recombinases," <i>Cell</i> . 92(6):841-850 (1998) Cell Press.

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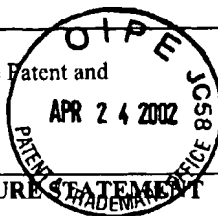
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JS	AAA	Cheng et al., "Mutational Analysis of 39 Residues of Vaccinia DNA Topoisomerase Identifies Lys-220, Arg-223, and Asn-228 as Important for Covalent Catalysis," <i>J. Biol. Chem.</i> 272(13):8263-8269 (1997) The American society for Biochemistry and Molecular Biology, Inc.
	AAB	DiGate and Marians, "Molecular Cloning and DNA Sequence Analysis of <i>Escherichia coli topB</i> , the Gene Encoding Topoisomerase III," <i>J. Biol. Chem.</i> 264(30):17924-17930 (1989). The American society for Biochemistry and Molecular Biology, Inc.
	AAC	Edery et al., "An Efficient Strategy to Isolate Full-Length cDNAs Based on an mRNA Cap Retention Procedure (CAPture)," <i>Mol. Cell. Biol.</i> , 15(6):3363-3371 (1995). American Society for Microbiology.
	AAD	Ericsson et al., "Characterization of <i>ts16</i> , a Temperature-Sensitive Mutant of Vaccinia Virus," <i>J. Virol.</i> 69(11):7072-7086 (1995) American Society for Microbiology.
	AAE	Gross and Shuman, "Vaccinia Virions Lacking the RNA Helicase Nucleoside Triphosphate Phosphohydrolase II are Defective in Early Transcription," <i>J. Virol.</i> 70(12):8549-8557 (1996) American Society for Microbiology.
	AAF	Haghighat and Sonenberg. "eIF4G Dramatically Enhances the Binding of eIF4E to the mRNA 5'-Cap Structure," <i>J. Biol. Chem.</i> , 272(35):21677-21680 (1997). The American society for Biochemistry and Molecular Biology, Inc.
	AAG	Haghighat et al., "The eIF4G-eIF4E Complex is the Target for Direct Cleavage by the Rhinovirus 2A Proteinase," <i>J. Virol.</i> 70:8444-8450 (1996). American Society for Microbiology.
	AAH	Henningfeld and Hecht, "A Model for Topoisomerase I-Mediated Insertions and Deletions with Duplex DNA Substrates Containing Branches, Nicks, and Gaps," <i>Biochemistry</i> 34(18):6120-6129. (1995) American Chemical Society.
	AAI	Invitrogen Corporation. <i>Invitrogen Catalog</i> , Carlsbad, California, pages 18, 29, 43, 44, 49-52 (1998).
JS	AAJ	Janknecht et al., "Rapid and Efficient Purification of Native Histidine-Tagged Protein Expressed by Recombinant Vaccinia Virus," <i>Proc. Natl. Acad. Sci., U S A</i> 88:8972-8976 (1991) National Academic of Sciences.

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JS	AAK	Kane and Shuman, "Vaccinia Virus Morphogenesis is Blocked by a Temperature-Sensitive Mutation in the I7 Gene that Encodes a Virion Component," <i>J. Virol.</i> 67(5):2689-2698 (1993) American Society for Microbiology.
	AAL	Kato et al., "Construction of a Human Full-Length cDNA Bank," <i>Gene.</i> 150: 243-250 (1994) Elsevier Science.
	AAM	Klemm et al., "Peptide Inhibitors of DNA Cleavage by Tyrosine Recombinases and Topoisomerases," <i>J. Mol. Biol.</i> 299(5):1203-1216. (2000) Academic Press, Inc.
	AAN	Klemperer et al., "Identification and Characterization of the orf Virus Type I Topoisomerase," <i>Virology</i> 206:203-215 (1995) Academic Press, Inc.
	AAO	Krogh and Shuman, "Vaccinia Topoisomerase Mutants Illuminate Conformational Changes During Closure of the Protein Clamp and Assembly of a Functional Active Site," <i>J. Biol. Chem.</i> July 5 2001 [Manuscript] The American Society for Biochemistry and Molecular Biology, Inc.
	AAP	Krogh and Shuman, "Catalytic Mechanism of DNA Topoisomerase IB," <i>Mol. Cell.</i> 5(6):1035-1041 (2000) Cell Press.
	AAQ	Krogh and Shuman, "DNA Strand Transfer Catalyzed by Vaccinia Topoisomerase: Peroxidolysis and Hydroxylaminolysis of the Covalent Protein-DNA Intermediate," <i>Biochemistry</i> 39(21):6422-6432. (2000) American Chemical Society.
	AAR	Krogh et al., "Effect of 2'-5' Phosphodiesterases on DNA Transesterification by Vaccinia Topoisomerase," <i>J. Biol. Chem.</i> 276(24):20907-20912. (2001) The American Society for Biochemistry and Molecular Biology, Inc.
	AAS	Krogh et al., "Melanoplus Sanguinipes Entomopoxvirus DNA Topoisomerase: Site-Specific DNA Transesterification and Effects of 5'-Bridging Phosphorothiolates," <i>Virology</i> 264(2):441-451. (1999) Academic Press, Inc.
JS	AAT	Liu et al., "Mapping the 5' and 3' Ends of Tetrahymena thermophila mRNAs Using RNA Ligase Mediated Amplification of cDNA Ends (RLM-RACE)," <i>Nucleic Acids Research</i> 21(21): 4954-4960. (1993) The Oxford University Press.


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JS	AAU	Lockard et al., "Labeling of Eukaryotic Messenger RNA 5' Terminus with Phosphorus-32: Use of Tobacco Acid Pyrophosphatase for Removal of Cap Structures," <i>Gene Amplification and Analysis</i> 2:229-251. (1981) Elsevier Science.
	AAV	Maruyama and Sugano, "Oligo-Capping: A Simple Method to Replace the Cap Structure of Eukaryotic mRNAs with Oligoribonucleotides," <i>Gene</i> . 138:171-174 (1994).
	AAW	Morham and Shuman, "Covalent and Noncovalent DNA Binding by Mutants of Vaccinia DNA Topoisomerase I," <i>J. Biol. Chem.</i> 267:15984-15992 (1992) The American Society for Biochemistry and Molecular Biology, Inc.
	AAX	Morham and Shuman, "Phenotypic Selection and Characterization of Mutant Alleles of a Eukaryotic DNA Topoisomerase I," <i>Genes. Dev.</i> 4(4):515-524 (1990) Cold Spring Harbor Laboratory Press.
	AAZ	Palaniyar et al. "SFV Topoisomerase: Sequence Specificity in a Genetically Mapped Interval," <i>Virology</i> 221:351-354 (1996). American Press, Inc.
	AAZ	Petersen and Shuman, "DNA Strand Transfer Reactions Catalyzed by Vaccinia Topoisomerase: Hydrolysis and Glycerololysis of the Covalent Protein-DNA Intermediate," <i>Nucleic Acids Res.</i> 25(11):2091-2097 (1997) Oxford University Press.
	BAA	Petersen and Shuman, "Histidine 265 is Important for Covalent Catalysis by Vaccinia Topoisomerase and is Conserved in all Eukaryotic Type I Enzymes," <i>J. Biol. Chem.</i> 272(7):3891-3896 (1997) The American Society for Biochemistry and Molecular Biology, Inc.
	BAB	Petersen et al., "Characterization of a DNA Topoisomerase Encoded by Amsacta Moore Entomopoxvirus," <i>Virology</i> 230(2):197-206 (1997) Academic Press, Inc.
	BAC	Petersen et al., "Mutations within a Conserved Region of Vaccinia Topoisomerase Affect the DNA Cleavage-Religation Equilibrium," <i>J. Mol. Biol.</i> 1263(2):181-195 (1996) Academic Press Limited.
	BAD	Salazar et al., "The DNA Strand in DNA-RNA Hybrid Duplexes is Neither B-Form nor A-Form in Solution," <i>Biochemistry</i> 32(16):4207-4215 (1993) American Chemical Society.
	BAE	Schmitt et al., "Affinity Purification of Histidine-Tagged Proteins," <i>Molecular Biology Reports</i> 18:223-230 (1993).
JS	BAF	Sekiguchi and Shuman, "Domain Structure of Vaccinia DNA Ligase," <i>Nucleic Acids Res.</i> 25(4):727-734 (1997) Kluwer Academic Publishers.

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JS	BAG	Sekiguchi and Shuman, "Mutational Analysis of Vaccinia Virus Topoisomerase Identifies Residues Involved in DNA Binding," <i>Nucleic Acids Res.</i> 25(18):3649-3656. (1997) Oxford University Press.
	BAH	Sekiguchi and Shuman, "Nick Sensing by Vaccinia Virus DNA Ligase Requires a 5' Phosphate at the Nick and Occupancy of the Adenylate Binding Site On the Enzyme," <i>J. Virol.</i> 71(12):9679-84 (1997) American Society for Microbiology.
	BAI	Sekiguchi and Shuman, "Site-Specific Ribonuclease Activity of Eukaryotic DNA Topoisomerase I," <i>Mol. Cell.</i> 1(1):89-97. (1997) Cell Press.
	BAJ	Sekiguchi and Shuman, "Covalent DNA Binding by Vaccinia Topoisomerase Results in Unpairing of the Thymine Base 5' of the Scissile Bond," <i>J. Biol. Chem.</i> 271(32):19436-19442 (1996). The American Society for Biochemistry and Molecular Biology, Inc.
	BAK	Sekiguchi and Shuman, "Identification of Contacts Between Topoisomerase I and Its Target DNA by Site-Specific Photocrosslinking," <i>EMBO J.</i> 15(13):3448-3457 (1996) Oxford University Press.
	BAL	Sekiguchi and Shuman, "Proteolytic Footprinting of Vaccinia Topoisomerase Bound to DNA," <i>J. Biol. Chem.</i> 270(19):11636-11645 (1995) The American Society for Biochemistry and Molecular Biology, Inc.
	BAM	Sekiguchi and Shuman, "Requirements for Noncovalent Binding of Vaccinia Topoisomerase I to Duplex DNA," <i>Nucleic Acids Res.</i> 22(24):5360-5 (1994) Oxford University Press.
	BAN	Sekiguchi and Shuman, "Stimulation of Vaccinia Topoisomerase I by Nucleoside Triphosphates," <i>J. Biol. Chem.</i> 269(47):29760-29764 (1994) The American Society for Biochemistry and Molecular Biology, Inc.
	BAO	Sekiguchi and Shuman, "Vaccinia Topoisomerase Binds Circumferentially to DNA," <i>J. Biol. Chem.</i> 269(50):31731-31734 (1994) The American Society for Biochemistry and Molecular Biology, Inc.
	BAP	Sekiguchi, et al., "Resolution of a Holliday Junction by Vaccinia Topoisomerase Requires a Spacer DNA Segment 3' of the CCCTT↓ Cleavage Sites," <i>Nucleic Acids Res.</i> 28(14):2658-2663. (2000) Oxford University Press.
	BAQ	Sekiguchi et al., "Kinetic Analysis of DNA and RNA Strand Transfer Reactions Catalyzed by Vaccinia Topoisomerase," <i>J. Biol. Chem.</i> 272(25):15721-15728 (1997) The American Society for Biochemistry and Molecular Biology, Inc.
JS	BAR	Sekiguchi, et al., "Mechanism of Inhibition of Vaccinia DNA Topoisomerase by Novobiocin and Coumermycin," <i>J. Biol. Chem.</i> 271(4):2313-2322 (1996) The American Society for Biochemistry and Molecular Biology, Inc.

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JS	BAS	Sekiguchi et al., "Resolution of Holliday Junctions by Eukaryotic DNA Topoisomerase I," <i>Proc. Natl. Acad. Sci. U S A.</i> 93(2):785-789. (1996) National Academic of Sciences.
	BAT	Shuman, "Analysis of Topoisomerase-DNA Interactions by Electrophoretic Mobility Shift Assay," <i>Methods Mol. Biol.</i> 95:65-74(2001) Humana Press, Inc.
	BAU	Shuman, "Polynucleotide Ligase Activity of Eukaryotic Topoisomerase I," <i>Mol. Cell.</i> 1(5):741-748. (1998) Cell Press.
	BAV	Shuman, "Vaccinia Virus DNA Topoisomerase: a Model Eukaryotic Type IB Enzyme," <i>Biochim. Biophys. Acta.</i> 1400(1-3):321-337. (1998) Elsevier Science.
	BAW	Shuman, "Vaccinia Virus DNA Ligase: Specificity, Fidelity, and Inhibition," <i>Biochemistry</i> 34:16138-16147 (1995) American Chemical Society.
	BAX	Shuman, "Novel Approach to Molecular Cloning and Polynucleotide Synthesis Using Vaccinia DNA Topoisomerase" <i>J. Biol. Chem.</i> 269(51):32678-32684 (1994).
	BAY	Shuman, "DNA Strand Transfer Reactions Catalyzed by Vaccinia Topoisomerase I", <i>J. Biol. Chem.</i> 267:8620-8627. (1992) The American Society for Biochemistry and Molecular Biology, Inc.
	BAZ	Shuman, "Two Classes of DNA End-Joining Reactions Catalyzed by Vaccinia Topoisomerase I", <i>J. Biol. Chem.</i> 267:16755-16758. (1992) The American Society for Biochemistry and Molecular Biology, Inc.
	CAA	Shuman, "Recombination Mediated by Vaccinia Virus DNA Topoisomerase I In Escherichia coli is Sequence specific," <i>Proc. Natl. Acad. Sci. U S A.</i> 88(22):10104-10108 (1991) National Academic of Sciences.
	CAB	Shuman, "Site-Specific DNA Cleavage by Vaccinia Virus DNA Topoisomerase I. Role of Nucleotide Sequence and DNA Secondary Structure," <i>J. Biol. Chem.</i> 266(3):1796-1803 (1991) The American Society for Biochemistry and Molecular Biology, Inc.
	CAC	Shuman, "Site-Specific Interaction of Vaccinia Virus Topoisomerase I with Duplex DNA. Minimal DNA Substrate for Strand Cleavage in vitro," <i>J. Biol. Chem.</i> 266(17):11372-11379 (1991) The American Society for Biochemistry and Molecular Biology, Inc.
JS	CAD	Shuman, "Vaccinia DNA Topoisomerase I Promotes Illegitimate Recombination in Escherichia coli," <i>Proc. Natl. Acad. Sci. U S A.</i> 86(10):3489-3493 (1989) National Academic of Sciences.

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JS	CAE	Shuman and Moss, "Identification of a Vaccinia Virus Gene Encoding a Type I DNA Topoisomerase," <i>Proc. Natl. Acad. Sci., U S A</i> 84:7478-7482. (1987) National Academic of Sciences.
	CAF	Shuman and Prescott, "Specific DNA Cleavage and Binding of Vaccinia Virus DNA Topoisomerase I" <i>J. Biol. Chem.</i> 265:17826-17836. (1990) The American Society for Biochemistry and Molecular Biology, Inc.
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	CAH	Shuman et al., "Intramolecular Synapsis of Duplex DNA by Vaccinia Topoisomerase," <i>EMBO J.</i> 16(21):6584-6589 (1997) Oxford University Press.
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<b>EXAMINER</b> 	<b>DATE CONSIDERED</b> 2/2/04
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EXAMINER: Initial if citation considered, whether or not citation is in conformance with MPEP 609; Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

<b>FORM PTO-1449</b> U.S. Department of Commerce Patent and Trademark Office	<b>Docket No.:</b> INVIT1290-2	<b>Application No.:</b> 10/014,128
	<b>Applicants:</b> Carrino et al.	
<b>INFORMATION DISCLOSURE STATEMENT BY APPLICANT</b>	<b>Filing Date:</b> December 5, 2001	<b>Group Art Unit:</b> Unknown

JS	CAO	Wang and Shuman, "Deletions at the Carboxyl terminus of Vaccinia DNA Topoisomerase Affect DNA Binding and Enhance Distributivity in DNA Relaxation," <i>Biochemistry</i> 36(13):3909-3916 (1997) American Chemical Society.
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<b>EXAMINER</b> <i>Jeffrey Liu</i>	<b>DATE CONSIDERED</b> 2/2/04
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EXAMINER: Initial if citation considered, whether or not citation is in conformance with MPEP 609; Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

<b>FORM PTO-1449</b> U.S. Department of Commerce Patent and Trademark Office	Docket No.: INVIT1290-2	Application No.: 10/014,128
	Applicants: Carrino et al.	
<b>INFORMATION DISCLOSURE STATEMENT</b> BY APPLICANT	Filing Date: December 7, 2001	Group Art Unit: Unknown

### U.S. PATENT DOCUMENTS

EXAM. INITIALS		DOCUMENT NUMBER	DATE	NAME	CLASS	SUB- CLASS	FILING DATE

### FOREIGN PATENT DOCUMENTS

EXAM. INITIALS		DOCUMENT NUMBER	DATE	COUNTRY	CLASS	SUB- CLASS	TRANSLATION (YES/NO)
JS		WO 01/62892 A2	08/30/2001	PCT			

### OTHER DOCUMENTS (Including Author, Title, Date, Pertinent Pages)


EXAMINER <i>Jeffrey Suv</i>	DATE CONSIDERED 2/2/04
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